Spain.—Madrid, May 14.—Terrific hailstorms, accompanied by thunder and lightning, have swept through central Spain, washing away railway tracks, inundating lowlands, and greatly damaging olive and fruit crops. The bull ring at Toledo is reported under water, and in the outskirts of Madrid trolley lines are blocked by huge quantities of sand that were washed down from the hills upon the tracks.—*New York Evening Post, May 15, 1920.*

Italy.— * * * Italy continued to suffer from disastrous drought.[1]

France.— * * * On the evening of the 25th a heavy storm, with hail and much wind, burst over Paris, unroofing houses, breaking windows, and destroying crops.[1]

Germany.—In Germany * * * there were severe thunder storms and considerable floods.[1]

[1] *The Meteorological Magazine*, June, 1920, pp. 99 and 104.

Canada.—In Ontario May was the driest month for 27 years, and the grain crops were backward, while the hay crops promised to be a partial failure. Forest fires developed in Ontario, Quebec, and New Brunswick, but fortunately the flames were checked by heavy rains at the beginning of June.[1]

Egypt.—Cairo recorded 99° F. on the 27th.[1]

New South Wales.—The wheat crop has been disastrously affected by the drought which has existed in all parts of New South Wales. It is estimated that the yield of the present season will be only 4,296,000 bushels, the smallest amount during the past 20 years. There is, in fact, an insufficient amount of wheat even for domestic consumption in Australia.—*Commerce Reports, Washington, D. C., May 26, 1920.*

[1] *The Meteorological Magazine*, June, 1920, pp. 99 and 104.

DETAILS OF THE WEATHER OF THE MONTH IN THE UNITED STATES.

CYCLONES AND ANTICYCLONES.

By R. HANSON WEIGHTMAN, Meteorologist.

Cyclones.—The number of LOWS was much greater than the average, the month being unusual on account of the great number of secondary developments. The table which follows gives the number of lows by types.

Lows.

	Alberta.	North Pacific.	South Pacific.	Northern Rocky Mountain.	Colorado.	Texas.	East Gulf.	South Atlantic.	Central.	Total.
May, 1920	5.0	0.0	0.0	2.0	7.0	1.0	2.0	2.0	0.0	19.0
Average number, 1892–1912	2.9	1.3	1.2	0.7	1.4	0.7	0.2	0.3	1.0	9.7

Anticyclones.—HIGHS were greater than the average in number, the Pacific highs being more frequent than usual, while the number of the Alberta type showed a deficit. The table hereunder shows the number of HIGHS by types.

Highs.

	North Pacific.	South Pacific.	Alberta.	Plateau and Rocky Mountain Region.	Hudson Bay.	Total.
May, 1920	3.0	2.0	2.0	1.0	1.0	9.0
Average number, 1892–1912	1.3	0.5	3.3	0.7	0.9	6.7

THE WEATHER ELEMENTS.

By P. C. DAY, Climatologist and Chief of Division.

[Weather Bureau, Washington, July 1, 1920.]

PRESSURE AND WINDS.

With the approach of summer, pressure variations in the United States and Canada become less pronounced, the high and low areas have weaker gradients than during the colder months of the year, and their drift eastward is usually slower and along more northerly paths. May, 1920, was no exception to the general rule, save that the storm areas developed generally in lower latitudes and the HIGHS persisted for longer periods in the districts from the Great Lakes eastward, than is usual for that month. As a result, the monthly distribution was somewhat different from the normal over the more eastern districts, with averages highest along the International Boundary from the Dakotas eastward and lowest along the south Atlantic and Gulf coasts, the reverse of the normal distribution. West of the Great Plains the average pressure distribution was maintained along the usual lines, save that the high-pressure area over the North Pacific coast was more fully developed and the permanent warm-season depression over the lower Colorado River Valley was deeper than usual.

In the general absence of well-developed storm areas, the winds were not unusually high at any point and few stations reported velocities above 50 miles per hour, and severe local storms were much less frequent than during the two preceding months. The highest wind of the month along the middle and south Atlantic coasts was experienced on the 1st and 2d, and the only severe tornado of the month occurred on the 2d in Oklahoma, a full description of which appears in another portion of this issue.

The persistence of high pressure over the Great Lakes and eastward caused cool northerly winds during much of the month over the districts to eastward of the Mississippi River, this being particularly the case over the southeastern States. Between the Mississippi River and the Rocky Mountains the winds were mostly from the south. Along the Pacific coast they were generally from west to northwest.

TEMPERATURE.

The month opened with moderate temperatures in most sections of the country, but by the morning of the 3rd abnormally cold weather overspread the northern districts, with heavy to killing frosts in the Lake region and over the upper Ohio Valley, and temperatures were below freezing in the higher elevations of the Rocky Mountains. About the middle of the first decade increasing pressure over the Great Lakes caused a further lowering of the temperature in eastern districts and heavy to killing frosts were reported from the adjacent regions. Considerably warmer weather prevailed during the latter part of the decade in the north-central border districts, but moderately cold weather for the season continued in the Eastern States until near the close, when much warmer weather prevailed over that area, and by that time temperatures had gradually risen to above the seasonal average in nearly all sections of the country except in the far West.

During the early part of the second decade low temperatures for the season overspread most sections, and frosts occurred locally from the Lake region eastward. On the 13th a sharp drop in temperature occurred in the central Mississippi and Ohio Valleys, and by the middle of the month cool weather had overspread practically all districts east of the Mississippi River, with heavy frosts in many central and killing frosts in northern districts. For the next several days unseasonably cold weather continued in the central and northeastern States, and temperatures continued somewhat below normal in nearly all other sections of the country. However, during the remainder of the decade temperatures had a rising tendency and at the end they were near the normal, except in the far Northwest, where cooler weather had set in.

Toward the middle of the third decade much colder weather overspread the Northern Plains and Central Rocky Mountain States, and unseasonably low temperatures prevailed in the far Northwest, heavy to killing frosts occurring in eastern Oregon, Idaho, western Montana, and northwestern Wyoming, and lower temperatures also prevailed in the Atlantic Coast States. During the latter part of the month temperatures rose to or somewhat above the normal in most sections east of the Rocky Mountains, but it continued unseasonably cool in the far Northwest, with frosts and freezing temperatures in many localities.

The maximum temperatures were not unusually high, and the minima were not lower than the records of many other years, despite the generally cold character of the month over much of the country. The warmest days of the month were during the last decade as a rule, although the highest temperatures reported in Texas and Oklahoma, 106° and 102°, respectively, occurred on the 3d, and in portions of the Southwestern States on the 5th, and in the far Northwest on the 7th. In portions of California and generally in the Rocky Mountain States, as well as along the northern border from Lake Superior westward and in portions of the Mississippi Valley, the lowest temperatures of the month were recorded during the first few days, principally on the 1st, when temperatures as low as 10° were reported. However, the lowest recorded temperature of the month, 8°, occurred on the 4th in Wyoming. In the Southeastern States, the latter part of the first decade had the lowest temperatures of the month, while in much of the plains region and thence eastward to the Middle Atlantic States the coldest weather was near the middle of the second decade.

The month as a whole was decidedly colder than the normal over the Middle Atlantic States; in some portions the monthly averages were lower than in any preceding May of which there is official record. The month was likewise cold in the Ohio and Middle Mississippi Valleys, and thence westward to the Rocky Mountains and in the far Northwest. The monthly means were slightly above normal in the lower Mississippi Valley and thence westward over Texas and the far Southwest, and also along the northern border from Lake Superior to the eastern and northern portions of the Dakotas.

PRECIPITATION.

Rain areas of wide extent were the exception during the month, although in some sections the rains were frequent and heavy. The most important rainy period during the month set in about the 10th, when a low-pressure area developed in the far Southwest and moved slowly into the middle plains region and thence eastward to the Atlantic coast. The precipitation attending this storm was well distributed over the central valleys and to the eastward and was copious to heavy in many districts. This was quickly followed by another rain area having its initial development in the same locality as the one referred to above. Its eastward progress was likewise slow; in fact, it can hardly be said to have had a distinctly progressive movement: but a rainy condition gradually overspread the central and eastern districts and some heavy falls resulted, particularly in Texas and Oklahoma, and thence eastward into the Mississippi Valley and portions of the Gulf and South Atlantic States. Some heavy rains occurred in New England near the beginning of the last decade, and a general rainy period set in over the plains region at the same time, some heavy falls occurring as it advanced northeastward to the Great Lakes. The greater part of the last decade was without general precipitation over extensive areas.

The total precipitation for the month was very generally less than normal, although no great shortage was experienced, save in restricted areas. In portions of the Middle and North Atlantic States, particularly in the Appalachian Mountain regions, the precipitation was far short of the usual amount for May. In some sections, particularly in the western portions of New York and Pennsylvania and in central North Carolina, the precipitation was the least ever known in May. Over the Pacific Coast States the monthly precipitation, though usually not heavy in May, was markedly deficient, due to the prevalence of high atmospheric pressure in the far Northwest, referred to previously. In such cases storms moving eastward from the North Pacific coast pass inland over Britisn Columbia or southern Alaska instead of over Washington, Oregon, or northern California. As a result of this no storms entered the United States directly from the Pacific during the month and but little precipitation occurred. In the interior valleys of California the month was practically rainless, notably at Sacramento, where the month was entirely without rain, the second such occurrence during the month of May in the past 72 years.

In the Gulf States and portions of Texas, New York, Nebraska, and South Dakota the precipitation was frequently far above the normal and at times unusually heavy, causing damage by flood and otherwise. In some States unusual extremes occurred in the total falls for the month, notably in Oklahoma, where they ranged from less than 2 inches to nearly 18 inches, and in South Dakota where the range was from less than 1 inch to more than 10 inches.

RELATIVE HUMIDITY.

The departure of the average relative humidity from normal was closely associated with the distribution of precipitation as is usually the case. In the middle and upper Mississippi Valley and thence eastward to the Great Lakes and New England, and southeastward to the middle Atlantic coast the average relative humidity was much less than normal, and similar conditions existed on the Pacific coast, where the relative dryness was at times very great, causing injury to plant growth in localities with insufficient ground moisture. In the middle and southern plains region and generally over the Gulf States relative humidity was in excess of the normal, frequently by a considerable percentage, particularly in Kansas and portions of surrounding States.

LOCAL STORMS.

Tornadoes occurred in northeastern Oklahoma on May 2, causing about 70 deaths and injuring about 150 people, mostly at Peggs, which was practically obliterated (see Apr. REVIEW, p. 211). On May 7 a windstorm damaged trees and some buildings in Taylor, Tex.